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Oat Variety Trials in South Dakota 1957-1961

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OAT VARIETY TRIALS IN SOUTH DAKOTA[1]/
1957-1961

A Progress Report

by

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A wide variation of climatic conditions during the 1961 season resulted in a great range of oat yields over the state. Eastern South Dakota growing conditions were generally very favorable with timely rainfall and below average temperatures over much of the area. Central and western oat production was limited by lack of adequate rainfall especially early in the growing season. Even in these areas, some production was possible because the cooler season lowered the moisture requirement and prevented a total failure of the crop.

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In eastern and southeastern areas, where the bulk of the oat acreage exists, many fields lacked adequate fertility to take advantage of the favorable growing conditions. Improved varieties can in no way substitute for proper management of the soil. Indeed, it may be true that varieties most productive under conditions of good management are less well adapted to conditions of poor soil fertility. When oats are grown following corn in a rotation, little of the indigenous soil fertility becomes available to the oat seedlings during the cool part of the season. During the seedling period the potential yield of oats can be seriously curtailed.

Yields reported in this publication are obtained under conditions of good management. In eastern South Dakota the test plots usually follow corn in a rotation. In western areas the plots are grown on summer fallow.

Plot size will vary from station to station depending upon the facilities available. In all cases, yields are reported from plots which have received uniform management. Each yield reported is actually an average of several measurements made at each location. These precautions are taken to avoid publishing data which could mislead the producer.

To further aid in the evaluation of these yields the L.S.D. (least significant difference) has been included with each yield column. In the strictest sense of the word, varieties should differ by at least this amount to be considered "significantly different." If this figure is replaced by the letters NS (not significant) this indicates that yield differences should be viewed with caution.

When it is necessary to compare the performance of a variety over several locations the column, % of 1961 location average, should be used. This percentage figure illustrates the degree to which the variety was superior or inferior in relation to the average of all other varieties tested under these conditions.

Even with these precautions, the individual using these data must remember that yield is not the only consideration necessary when a variety is evaluated. Maturity, disease reaction, heat tolerance and kernel type are also important. The variety Minton serves as a good example of this. In many cases it is high yielding but very low in test weight making it undesirable from the feeding standpoint. Other examples may be cited in this regard. Dupree and Osage will yield well under disease free conditions in eastern areas of the state but lodge badly and constitute a high disease hazard.

The excellent performance of Burnett, Mo-0-205 and Andrew in the east-central area of the state is in line with the long term average of these types. The unseasonably cool temperatures at Brookings (Table 1) favored the growth of varieties such as Garry and Rodney which are known to do well under these conditions.

Disease was a major factor in oat production only at the Southeast Station. Here the virus disease, commonly known as Barley Yellow Dwarf or Red Leaf, infected the plots early in the season. This disease severely reduced the yield of the more susceptible varieties.

Table 1. Monthly Temperature and Rainfall Distributions at the Stations at which Test Plots were grown in 1961*

Total inches of rainfall at test site locations

	Brookings	Highmore	Eureka	Cottonwood	Newell	Centerville	Watertown
April	.97	.46	1.31	.37	1.13	.80	1.53
May	6.00	5.15	2.39	3.44	.71	4.29	5.58
June	4.64	2.19	2.61	2.67	2.25	4.36	4.05
July	2.03	2.04	1.67	2.69	1.71	3.92	.79
August	5.52	1.04	1.33	.59	.55	3.23	2.03
Total	19.16	10.88	9.31	9.76	6.35	16.60	13.98

Departure from long-term average rainfall

April	-.84	-1.25	-.55	-1.25	-.62	Not	-.53
May	3.35	2.97	-.01	.87	-1.87	Avail-	2.78
June	.65	-1.97	-1.41	-.23	-.98	able	.24
July	-.03	.24	-.70	1.30	-.04		-2.05
August	2.62	-.95	-.87	-.66	-.72		-.62
Total	5.75	-.96	-3.54	.03	-4.23		-.18

Average monthly temperatures at test site locations

	Brookings	Highmore	Eureka	Cottonwood	Newell	Centerville	Watertown
April	40.2	41.3	40.8	42.3	40.8	45.6	37.9
May	53.4	53.6	53.1	55.4	54.4	59.1	51.9
June	66.3	67.5	69.0	69.1	70.0	71.4	67.1
July	68.8	72.2	69.9	73.0	71.8	75.1	69.1
August	70.7	75.7	74.1	77.2	75.2	75.4	73.2

Departure from long-term average temperatures

April	-5.2	-4.5	-4.7	-4.5	-3.8	Not	-5.5
May	-4.2	-3.6	-3.2	-1.9	-1.0	Avail-	-4.2
June	-1.1	0.8	3.9	2.3	5.8	able	1.3
July	-4.9	-2.7	-2.9	-2.9	-1.7		-3.5
August	-0.6	2.9	3.5	3.5	4.0		3.1

* Data courtesy U. S. Weather Bureau, Huron, South Dakota

Table 2. Oat Variety Tests at the Main Experiment Station, Brookings, 1957-1961.

Variety	Average Yield, Bu/A.						Test wt.	% of 1961 Location
	1957	1958	1959	1960	1961	1957-61	1961	Average
Burnett	104.9	73.4	39.5	117.7	113.8	89.9	36	114.0
Minton		80.1	38.5	116.3	113.4		34	113.6
Garry	103.2	68.8	41.0	118.0	111.7	88.5	35	111.9
Portage				121.6	107.4		36	107.6
Clintland 60		73.3	31.0	119.1	106.4		36	106.6
C.I. 7473				118.4	106.4		37	106.6
Waubay	98.2	67.7	37.0	120.9	104.2	85.6	38	104.4
Rodney	94.3	70.9	34.5	103.9	103.9	81.5	37	104.1
Dupree	112.7	69.5	44.5	124.1	101.4	90.4	34	101.6
Nehawka		56.9	33.5	129.7	100.7		35	100.9
Nodaway					98.9		38	99.1
Mo-0-205	100.7	73.4	45.5	126.2	98.6	88.9	38	98.8
Minhafer	95.4	59.9	38.0	113.8	98.2	81.1	36	98.4
Tonka					97.1		42	97.3
Ransom	105.3	63.8	41.0	118.0	96.8	85.0	35	97.0
Goodfield		57.1	21.0	105.6	96.4		40	96.6
Putnam 61					96.1		38	96.3
Cherokee	89.3	57.1	39.5	119.5	90.0	79.1	36	90.2
Andrew	102.1	57.4	40.5	125.1	89.0	82.8	38	89.1
Dodge					86.5		37	86.7
Marion	97.5	73.4	39.5	117.7	78.0	81.2	36	78.2
L.S.D.	N.S.	9.5	5.9	7.8	15.9			

Table 3. Oat Variety Tests at the Central Substation, Highmore, 1957-1961.

Variety	Average Yield, Bu/A.						Test wt.	% of 1961 Location
	1957	1958	1959	1960	1961	1957-61	1961	Average
Burnett	64.1	97.1	*	72.2	47.1	70.1	34	116.3
Waubay	67.9	100.9		73.4	46.7	72.2	32	115.3
Nodaway					46.4		34	114.6
Clintland 60		93.2		42.7	45.6		32	112.6
Macon					45.2		33	111.6
Minhafer	69.6	93.0		70.4	44.8	69.4	30	110.6
Putnam 61					44.6		32	110.1
Portage				77.7	43.6		35	109.0
Nehawka		97.6		76.8	42.9		33	105.9
Cherokee	56.3	87.9		64.6	42.0	62.7	32	103.7
Ransom	57.3	84.6		54.8	41.5	59.5	30	102.5
Mo-0-205	71.1	92.7		69.0	41.5	68.6	30	102.5
Dupree	70.2	80.5		63.4	40.6	63.7	28	100.2
Goodfield				60.1	40.4		34	99.8
Andrew	65.6	84.0		84.1	39.0	68.2	31	96.3
Marion	59.5	91.0		61.9	37.9	62.6	31	93.6
Osage	62.0	105.2		73.9	37.0	69.5	28	91.4
Tonka					36.7		37	90.6
Garry	56.5	88.4		69.7	35.5	62.5	31	87.7
Minton					35.1		26	86.7
C.I. 7473				62.1	33.3		32	82.2
Dodge					27.6		28	68.1
L.S.D.	16.0	17.6		14.7	6.0			

* Crop failure due to drought and accompaning high June temperature

Table 4. Oat Variety Tests at the North Central Substation, Eureka, 1957-1961.

Variety	Average Yield, Bu/A.						Test wt.	% of 1961 Location
	1957	1958	1959	1960	1961	1957-61	1961	Average
Dupree	92.8	115.0	38.4	27.8	38.5	62.5	34	133.7
Minhafer	97.5	111.3	31.1	30.4	36.5	61.4	35	126.7
Marion	80.0	94.6	41.3	34.1	36.1	57.2	35	125.3
Burnett	91.4	94.3	47.6	33.6	35.8	60.5	38	124.3
Andrew	98.7	110.7	35.8	36.4	33.4	63.0	35	116.0
C.I. 7434				35.4	33.4		38	116.0
Mo-0-205	90.4	120.9	19.1	37.2	33.1	60.1	35	114.9
Osage	83.6	118.2	27.6	32.0	31.8	58.6	33	110.4
Shield			34.2	36.6	30.8		33	106.9
Garry	87.4	100.4	43.6	32.0	29.5	58.6	36	102.4
Nehawka					29.1		36	101.0
Nehawka				32.6	29.1		36	101.0
Ransom	85.8	108.5	27.4	26.8	28.4	55.4	34	98.6
Putnam 61					26.6		33	92.4
Waubay	91.1	110.2	27.5	30.2	25.8	57.0	34	89.6
Nodaway					25.7		39	89.2
Clintland 60		108.6	30.1	28.0	24.0		34	83.3
Dodge					23.7		33	82.3
Goodfield			28.4	33.2	22.8		35	79.2
Minton			28.9	29.4	22.8		32	79.2
Tonka					13.1*		38	45.5
L.S.D.	15.9	16.8	N.S.	N.S.	9.5			

* This variety heavily damaged by grasshoppers.

Table 5. Oat Variety Tests at the Range Field Station, Cottonwood, 1957-1961.

Variety	Average Yield, Bu/A.						Test wt.	% of 1961 Location
	1957	1958	1959	1960	1961	1957-61	1961	Average
Andrew	46.2	101.5	34.1	58.9	23.1	52.8	41	162.7
Osage	46.6	110.3	30.2	69.0	19.4	55.1	38	136.6
Portage				51.7	19.4		40	136.6
Nehawka		87.8	31.6	67.5	18.1		40	127.5
Tonka					16.6		42	116.9
Mo-0-205	50.8	107.2	31.9	53.4	13.7	51.4	40	96.5
Ransom	34.1	94.1	33.8	51.6	12.9	45.3	41	90.8
Cherokee	30.5	78.0	29.9	50.9	11.7	40.2	43	82.4
Marion	43.2	95.7	36.0	58.3	11.2	48.9	41	78.9
Minhafer	45.3	77.9	34.6	59.6	10.7	45.6	41	75.4
Clintland 60			29.4	45.6	9.4		40	66.2
Dupree	50.6	91.7	29.8	79.4	9.3	52.2	39	65.5
Garry	44.2	100.8	34.1	66.2	9.3	50.9	42	65.5
L.S.D.	8.0	16.3	N.S.	N.S.	N.S.			

Table 6. Oat Variety Tests Under Irrigation at the U.S.D. & I. Station, Newell, 1957-1961.

Variety	Average Yield, Bu/A.						Test wt.	% of 1961 Location
	1957	1958	1959	1960	1961	1957-61	1961	Average
Burnett	43.4	*	88.0	79.9	11.8	55.8	26	129.6
Marion	49.1		74.6	88.3	11.6	55.9	30	127.5
Vikota	49.6		69.9	90.5	10.4	55.1	30	114.2
Dodge					10.4		24	114.2
C.I. 7473				96.7	10.1		21	111.0
Ransom	36.3		78.2	85.5	10.1	52.5	22	111.0
Waubay	50.5		82.5	100.1	9.7	60.7	24	106.5
Trojan	49.1		83.1	108.7	9.3	62.6	25	102.2
Garry	35.7		86.3	97.0	9.3	57.0	20	102.1
Dupree	50.7		75.4	94.1	9.0	57.3	29	98.9
Rodney	26.5		104.4	98.8	8.9	59.6	22	97.8
Goodfield			58.7	76.5	8.7		24	95.6
Minhafer	43.8		80.2	80.3	8.3	53.1	27	91.2
Mo-0-205	51.8		82.2	87.3	8.2	57.3	27	90.1
Portage				86.4	8.2		22	90.1
Park	40.6		94.3	92.9	8.1	59.0	22	89.0
Ajax	47.7		77.2	93.7	7.8	56.6	22	85.7
Tonka					7.3		28	80.2
Osage	44.1		74.9	101.4	7.2	56.9	26	79.1
Nehawka			72.8	84.5	7.1		26	78.0
Clintland 60			67.0	83.6	7.0		26	76.9
L.S.D.	13.5		12.1	6.4	N.S.			

* Crop hailed out

Table 7. Oat Variety Tests on Dryland at the U.S.D. & I. Station, Newell, 1957-1961.

Variety	Average Yield Bu/A.				
	1957	1958	1959	1960	1961
Dupree	59.0	*	6.0	28.1	**
Andrew	51.4		5.4	26.4	
Macon			5.2	25.2	
Minhafer	53.5		3.8	24.6	
Osage	52.2		5.4	24.6	
Shield			5.2	24.0	
Mo-0-205	56.8		5.9	23.2	
Ransom	59.6		6.7	22.5	
Nehawka			5.4	22.1	
Clintland 60			6.5	20.6	
Brunker	50.2		2.9	19.8	
Putnam				19.4	
L.S.D.	N.S.		N.S.	N.S.	

* Crop hailed out

** Crop failure due to drought

Table 8. Oat Variety Tests at the Southeast Research Farm, Centerville, 1957-1961.

Variety	Average Yield, Bu/A.						Test wt.	% of 1961 Location
	1957[1]	1958[1]	1959[1]	1960[1]	1961	1957-61	1961	Average
Andrew	83.4	64.1	7.3	89.7	65.5	62.0	34	131.5
Marion	79.4	59.4	7.0	73.7	60.5	56.0	30	121.5
Nehawka	90.4	44.0	14.6	84.7	58.1	58.4	33	116.7
Mo-0-205	84.6	69.9	6.9	96.3	56.5	62.8	34	113.4
Minhafer	98.8	59.2	12.4	77.9	56.2	60.9	34	112.8
Garry	80.6	64.1	3.5	81.8	55.2	57.0	33	110.8
Portage				91.0	54.0			108.4
Minton	96.1	44.9	7.0	77.1	48.6	54.7	31	97.6
Ransom	81.9	62.7	7.4	70.6	46.8	53.9	34	94.0
Burnett	89.9	64.9	8.3	89.6	45.5	59.6	34	91.4
Nodaway					45.1		40	90.6
Cherokee	89.3	57.0	9.5	84.7	44.4	57.0	34	89.2
Goodfield	80.1	41.1	5.4	78.2	43.8	49.7	36	88.0
Waubay	88.7	55.9	8.5	73.5	40.2	53.4	33	80.7
Tonka					38.1		41	76.5
Clintland 60	103.2	48.3	4.4	88.2	37.8	56.4	32	75.9
L.S.D.	4.9	N.S.	4.6	14.3	12.0			

[1] Data from plots previously located on test area near Menno

Table 9. Oat Variety Tests at the Northeast Station, Watertown 1957-1961.

Variety	Average Yield, Bu/A.						Test wt.	% of 1961 Location
	1957	1958	1959	1960	1961	1957-61	1961	Average
Mo-0-205	66.2	107.7	14.1	40.0	99.3	65.5	35	109.6
Andrew	72.5		16.4	77.9	96.9	65.9	38	107.0
Minton			23.6	66.1	96.3		32	106.5
Portage					95.5		35	105.4
Garry	69.4	123.8	19.3	65.9	94.9	74.7	36	104.8
Waubay	74.3	101.1		70.6	93.9		37	103.6
Burnett	73.6	115.3	19.4	73.3	92.5	74.8	38	102.1
Nodaway					92.4		36	102.0
Ransom	72.1	104.9	15.5	61.9	91.5	69.2	35	101.0
C.I. 7473				73.6	91.0		39	100.4
Dodge					91.0		39	100.4
Minhafer	76.1	111.5	23.9	74.8	89.8	75.2	35	99.1
Clintland 60			11.2	58.0	89.4		37	98.7
Rodney	72.9	128.5	20.7	80.0	88.7	78.2	37	97.9
Marion	79.5	107.7		74.8	88.2		33	97.4
Cherokee	70.1	102.1		65.9	85.6		35	94.4
Tonka					85.5		37	94.4
Nehawka					85.4		36	94.3
Putnam 61					84.1		35	92.8
Goodfield			10.6	64.9	79.7		38	88.0
L.S.D.	11.5	11.3	7.6	N.S.	8.6			

Table 10. Oat Variety Tests at the Plankinton Clay-Pan Farm, 1960-1961.[1]

Variety	Average Yield, Bu/A. 1960	Average Yield, Bu/A. 1961	Test wt. 1961	% of 1961 Location Average
Nodaway		50.9	27	115.9
Mo-0-205	58.2	49.7	35	113.2
Nehawka	55.6	48.8	37	111.2
Marion	49.0	47.9	32	109.1
Andrew	59.4	46.3	33	105.5
Tonka		46.3	40	105.5
Clintland 60	37.2	46.0	33	104.8
Cherokee	45.9	45.6	35	103.9
Burnett	46.6	42.6	34	97.0
Minhafer	45.6	40.9	35	93.2
Portage		39.3	29	89.5
Dodge		34.2	32	77.9
C.I. 7473		31.7	29	72.2
L.S.D.	6.0	6.7		

[1] These test are included as a special service to producers and do not constitute a permanent part of the variety testing program.

Table 11. Oat Performance Notes, 1961.

Variety	Brookings 1961				Centerville 1961	
	Date Headed	Height Inches	Crown * Rust %	Stem * Rust %	BYD ** Virus 0-9	Crown * Rust %
Andrew	6-21	40	35	15	2	2
Burnett	6-24	39	15	--	3	2
Cherokee	6-22	38	15	5	3	20
Clintland 60	6-25	37	10	--	4	Tr
Dodge	6-25	38	1	--	4	Tr
Dupree	6-21	37	20	5	2	20
Garry	7-1	42	10	--	2	10
Goodfield	6-23	35	1	--	4	Tr
Marion	6-22	39	15	10	6	10
Minhafer	6-20	39	5	--	2	Tr
Minton	6-25	37	5	--	1	5
Mo-0-205	6-21	38	25	15	4	5
Nehawka	6-21	35	15	5	6	5
Nodaway	6-19	40	25	--	4	Tr
Osage	6-22	34	20	20	2	10
Portage	6-30	41	1	--		
Putnam 61	6-19	37	2	--	2	--
Ransom	6-21	40	15	--	1	Tr
Rodney	7-4	40	15	--		
Sauk	7-2	40	10	1		
Tonka	6-19	35	45	10	1	30
Waubay	6-24	41	40	10	2	10
C.I. 7473	7-1	41	15	--	6	10

* Rust infections appeared late in the growing season and probably had little effect on yield.

** Barley Yellow Dwarf (BYD) virus also known as Red Leaf on oats. These infections caused considerable damage to yields among heavily infected varieties at the Centerville location.